Southwest Area Transportation Study

Final Report - Executive Summary

in support of the

MAG Regional Transportation Plan

September 2003

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PREPARED FOR:

Maricopa Association of Governments

IN SUPPORT OF THE

MAG Regional Transportation Plan

PREPARED BY:

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1 Background and Study Purpose

As the metropolitan planning organization (MPO) for the Maricopa region, the Maricopa Association of Governments (MAG) is charged with planning and prioritizing improvements to transportation infrastructure and services. As part of MAG's responsibilities, the organization is preparing a new Regional Transportation Plan (RTP) that will establish priorities and funding for major transportation improvements across the region.

The Southwest Area Transportation Study (SWATS) is one of several background studies conducted in support of the RTP. While providing a stand-alone transportation blueprint for the southwest, including all or part of the jurisdictions of Avondale, Buckeye, Gila Bend, Goodyear, Litchfield Park, Phoenix, Tolleson, and the unincorporated areas of Maricopa County, the SWATS provides additional local input and specific background information as well as recommendations for major transportation investments for the rapidly growing area for consideration in the RTP.

Two studies conducted in parallel with this study address transit issues in more detail. The Valley Metro Regional Transit System (RTS) Study and the MAG High Capacity Transit (HCT) System Study address regional bus and light transit/express bus/Bus Rapid Transit respectively. Copies of the background studies as well as the RTP are available at the MAG website (www.mag.maricopa.gov).

1.1 Study Area

Figure 1 shows the area encompassed by the SWATS. As requested by local agencies, the northern boundary of the SWATS is overlapped slightly with the southern boundary (i.e. I-10) of the Northwest Area Transportation Study (NWATS), which was conducted in parallel with the SWATS. Throughout the development of the SWATS, the study team coordinated efforts with those performing the NWATS.

1.2 Study Process and Methodology

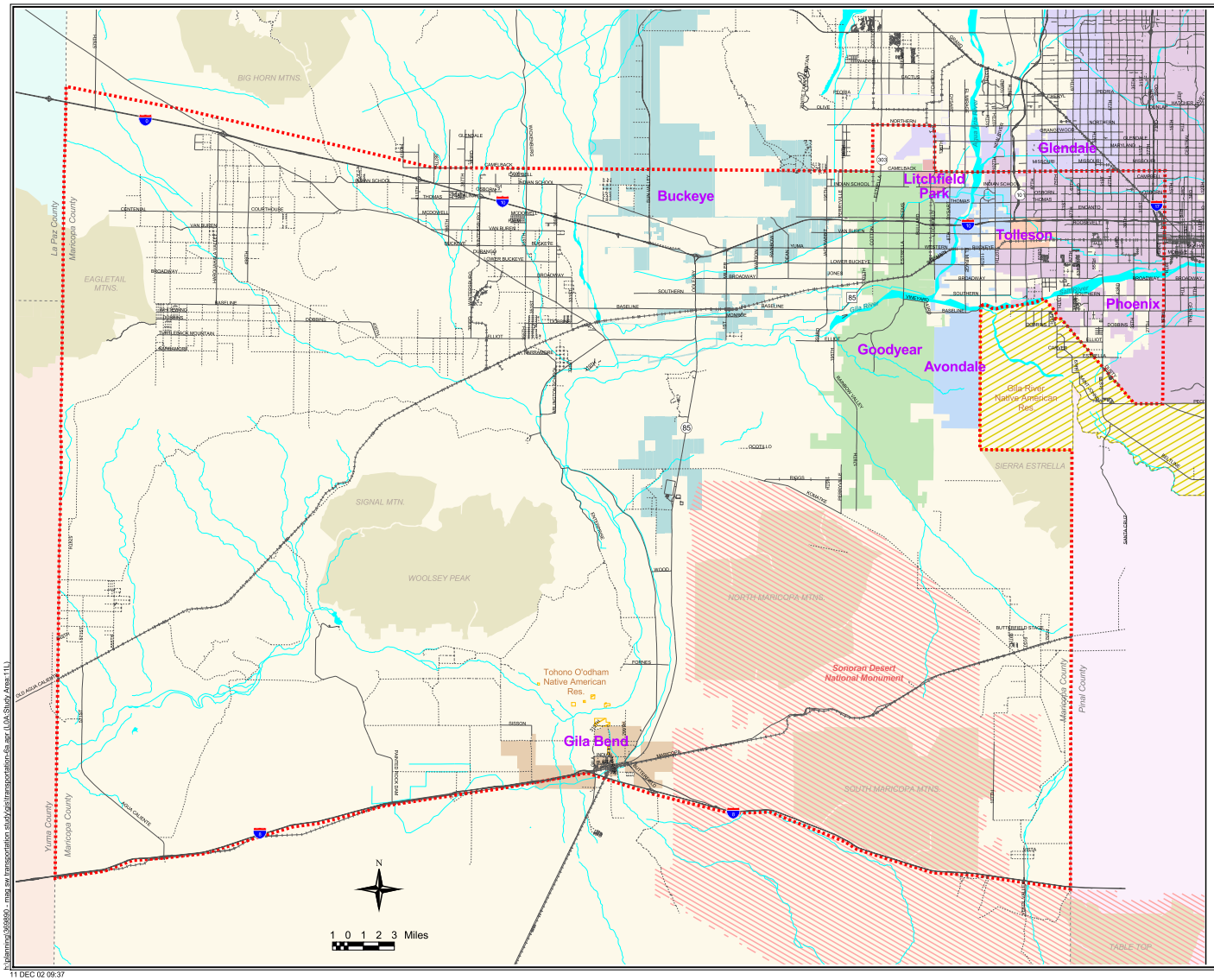
The overall process of the SWATS was a very open one, involving MAG member agencies, key stakeholders, and the public in the study area. The study developed several working papers which have been included as chapters of this Final Report. Table 1 summarizes the working papers prepared during the study.

2 Consultation Process

A consultation plan was implemented during the study to inform and obtain representative input from all affected and interested stakeholders. There were four objectives of the consultation:

- Obtain public feedback related to growth and transportation;
- Provide timely, accurate, and effective distribution of information;
- Build consensus though a fair and reasonable process; and
- Maintain continuity of involvement.

The consultation plan consisted of three major components:



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Southwest Area Transportation Study

Figure 1
Study Area Map

Study Area Boundary

November 2003

Source: Maricopa Association of Governments, U.S. Census Bureau, Wilbur Smith Associates

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Table 1
Working Papers and Chapters in the Final Report

Chapter/Working Paper No. 1: Related Studies	Summarizes studies and documents related to transportation and land use for the MAG member agencies in the study area.
Chapter/Working Paper No. 2: Socioeconomic Characteristics and Forecasts	Documents population and employment trends in the study area.
Chapter/Working Paper No. 3: Current and Future Transportation Facilities and Conditions	Documents existing and currently planned transportation facilities and services in the study area, and summarizes current and expected future usage of these facilities.
Chapter/Working Paper No. 4: Summary of Transportation Issues to Date	Summarizes transportation issues identified through the review of previous studies (Chapter 1) and consultation with MAG member agencies, stakeholders and public, including interviews and surveys with key agency staff and officials for the local jurisdictions, as well as technical assessments.
Chapter/Working Paper No. 5: Evaluation of Transportation Options in the SWATS Area	Evaluates options to address the issues identified in Chapter 4 including analysis of travel forecasting models incorporating potential options.
Chapter/Working Paper No. 6: Ultimate Concepts for Transportation Facilities	Develops recommendations for consideration in the RTP development process based on the assessment in Chapter 5.

- Agency/Stakeholder Consultation;
- Other Public Involvement; and
- Title VI/Environmental Justice.

2.1 Agency & Stakeholder Consultation

Agency/stakeholder consultation involved interviews, surveys, and forums. Interviews and surveys were conducted with agency staff and elected officials. The interviews were generally held in the early weeks of the study, but continued throughout the time frame of the project. Forums were open to MAG member agencies, stakeholders and the public. The following groups were included in the agency/stakeholder consultation process:

- Elected officials in the SWATS area including municipal and county office holders;
- Local government transportation and planning department heads;
- Chambers of Commerce;
- Homeowners associations;
- Major developers;
- Local environmental groups;
- School district administrators;
- Minority group representatives;
- Churches in areas with high Title VI and Environmental Justice populations;
- Senior centers;
- The southwest valley transit group;
- Trucking companies;

- Freight railroads; and,
- General public.

Survey forms were used to help assure thorough input among the various entities. The standardized survey forms were used to ensure answers were consistent, accurate and complete. In addition to interviews and surveys, several agency forums as well as open houses and public meetings were held as outlined in Table 2.

The study considered environment justice issues and Title VI populations and proactively consulted those groups. The main report provides details of this review.

Table 2
Forums, Open Houses and Public Meetings

Meeting	Venue	Date and Time Held
Agency Workshop	Goodyear City Hall	June 26, 2002, 10:00 a.m.
Open House and Public Meeting	Estrella Mountain Community College	September 10, 2002, 5:00 p.m.
Agency Workshop	Goodyear City Hall	December 12, 2002, 10:00 a.m.
MAG Transportation Committee	MAG Saguaro Room	January 30, 2003, 10:00 a.m.
Agency Forum	Goodyear City Hall	February 18, 2003, 10:00 a.m.
Agency Forum	Avondale Fire Station No. 172	July 15, 2003, 10:00 a.m.
Agency Forum	Goodyear City Hall	September 5, 2003, 10:00 a.m.
Open House and Public Meeting	Goodyear City Hall	September 5, 2003, 5:00 p.m.

In addition to the above formal meetings, a formal study area tour was conducted on May 2, 2002, from 1:00 p.m. to 4:00 p.m. to obtain feedback from local elected public officials.

2.2 Public Involvement

Two open house and public meeting events were held as listed above. Along with the open house events, a brief presentation was made by the study staff at these events. The SWATS was a very open process and the study team responded to many one-on-one questions throughout the course of the study. All project materials including draft papers were posted on the MAG web site, where contact information and links to selected studies such as the NWATS and RTP were also provided. While agency forums focused on the various jurisdictions and agencies impacted by the work, the forums were also open to the general public.

3 Socioeconomic Characteristics and Forecasts

Socioeconomic characteristics and forecasts are important inputs to the computerized area travel demand model which is used to estimate traffic and related parameters, such as trip generation, traffic volumes and levels of service for area roadways and evaluate future capacity improvements to the transportation system. Tables 3 and 4 present draft interim population and employment forecasts developed for the RTP. Two scenarios are presented: Scenario 1, which generally corresponds to approximately the Year 2020; and Scenario 2, which generally corresponds to approximately the Year 2030. The study focused on meeting the transportation demand for the two scenarios regardless of the specific year the values were achieved. Population and employment values for each of the two scenarios may be reached a little earlier or later than 2020 and 2030, respectively, but will inevitably be reached.

It should be emphasized that the population and employment figures for Scenario 1 and Scenario 2 are interim values. New socioeconomic forecasts for the region are under development by MAG for use in the RTP and will supercede the values used in this SWATS study.

The sub-areas projected to have the highest population and employment for Scenario 1 and Scenario 2 are in the northeastern quadrant of the study area (Tolleson, Goodyear and Avondale), and along the S.R. 85/I-8 corridor near Gila Bend. Through 2030, much of the southwest area will be comprised of vast areas with lower densities of both population and employment. Over the next thirty years, population for the study area will increase by approximately 270%. In other words, population in 2030 in the Southwest Valley will be about 3.5 to 4 times greater than the 2000 population.

Table 3*
Total Population, Alternative Scenarios

MPA	Total Population Year 2000	Total Population Alternative Scenario 1 Year 2020	Total Population Alternative Scenario 2 Year 2030
County (unincorporated areas)	7,407	20,244	39,696
**Buckeye	16,513	149,578	377,438
Avondale	37,827	103,457	114,374
Gila Bend	2,264	6,004	17,979
**Glendale	2,394	5,380	5,381
Litchfield Park	3,831	14,095	14,573
Tolleson	4,998	6,314	6,338
Goodyear	21,246	162,623	334,652
**Phoenix	289,503	464,403	524,347
Total	**385,983**	**932,098**	**1,434,778**

*Socioeconomic data presented here are preliminary and subject to change in the RTP.
**Reflects population only within the southwest study area boundaries

Table 4*
Total Employment, Alternative Scenarios

MPA	Total Employment Year 2000	Total Employment Alternative Scenario 1 Year 2020	Total Employment Alternative Scenario 2 Year 2030
County (unincorporated areas)	6,548	13,322	20,652
**Buckeye	7,006	69,151	172,752
Avondale	9,041	54,644	64,229
Gila Bend	1,191	4,424	12,165
**Glendale	10,807	16,694	20,520
Litchfield Park	1,178	5,059	4,703
Tolleson	12,777	24,753	31,973
Goodyear	13,895	115,434	185,722
**Phoenix	119,088	233,287	309,328
Total	**181,531**	**536,768**	**822,044**

*Socioeconomic data presented here are preliminary and subject to change in the RTP.
**Reflects employment only within the southwest study area boundaries

4 Transportation Facilities and Conditions

4.1 Existing Conditions

The southwest is growing rapidly and its transportation system is in stages of development. The northeast quadrant of the study area already has a reasonably well-developed grid system of arterial roadways consistent with population density and with development still occurring. This existing grid system extends westward and to the south of the I-10 corridor. The rest of the study area is less developed, and is characterized by pockets of roadway development and other passenger transportation facilities.

Terrain plays a significant role in the development of a transportation network in parts of the study area, such as the North Maricopa Mountains, the South Maricopa Mountains, Woolsey Peak, Signal Mountain, and the Eagle Tail Mountains. Large preserve and wilderness areas are contained within the central and southern portions of the study area.

Except for the northeast quadrant and the I-10 corridor, much of the study area is lightly populated with limited transportation services, facilities and needs. Therefore, the focus of the study effort was on the areas (northeast quadrant and the I-10 corridor) where population and employment are currently greater, and on those sub-areas that are expected to experience population and employment growth in the next 50 years, thus requiring improved transportation facilities and services.

4.1.1 Existing Roadways

The SWATS roadway network includes all of the state and county highways in the study area, as well as local streets in all or part of Avondale, Buckeye, Gila Bend, Glendale, Goodyear, Litchfield Park, Phoenix, Tolleson, and the unincorporated portions of Maricopa

County. Roadways are classified according to function served in the circulation system. MAG's classification includes freeways, HOV lanes, expressways, arterials and collectors. Figure 2 shows the functional classification of the 2002 roadway network in the study area.

Table 5 shows the centerline miles of the 2002 roadway network by functional class based on MAG's traffic model. The table shows that there are currently over 4,000 centerline miles of streets and highways in the study area, and that 1,000 (25 percent) of those miles are classified, i.e., of a functional class higher than local streets. Table 6 shows the number of lane miles for all roadways classified by MAG in the study area. Figure 3 graphically portrays the number of roadway "through" lanes on the 2002 base network.

4.1.2 Existing Public Transit

Public transit in the region includes a variety of facilities and services. In addition to the traditional fixed route bus services, transit also includes other ridesharing alternatives such as carpooling, vanpooling, and bikes on buses. It also includes dial-a-ride services and some paratransit services offered by social service agencies.

RPTA is the predominant provider of public transit services in the study area, and provides the bulk of the regular route transit service on 19 bus routes. These routes are shown in Figure 4. Other providers in the study area include the City of Phoenix, Greyhound, Maricopa County Department of Human Services, and Southwest Transit and Regional Transportation (START).

4.1.3 Existing Non-motorized Transportation System

Non-motorized forms of transportation include walking, bicycling, roller-blading and horseback riding. Typical origins for non-motorized travel in the study area are residential areas, transit stations, resort areas, and access points for backcountry travel. Human-powered transportation occurs on shared streets, streets with bike lanes, streets marked as bike routes, sidewalks, multi-use paths built on separate rights-of-way, and multi-use trails built on separate rights-of-way.

In general, all streets are open to bicyclists and pedestrians, unless specifically designated and posted otherwise. The existing street grid provides basic access and connections for bicycle and pedestrian travel. Figure 5 shows the major non-motorized facilities in the study area. Power lines or gas lines may also represent potential non-motorized corridors and further study will be needed to identify appropriate facilities at those locations.

4.1.4 Existing Intelligent Transportation Systems (ITS)

The MAG region has extensive ITS programs that include Traffic Signal Coordination, ADOT's Freeway Management System (FMS), and the Metropolitan Model Deployment Initiative.

Existing freeways in the study area will be among the first to be added to the Regional Freeway Management System (FMS). New freeways, such as Loop 303 and the I-10 Reliever, will be added to the FMS upon their completion.

All arterial traffic management systems are operated independently by the municipalities in the study area and elsewhere throughout the MAG region. A number of municipalities in the study area either have or are planning to build local Traffic Management Centers (TMSs). Efforts are already underway to integrate individual agency systems and the FMS as a regional traffic management system. The regional architecture that will serve as the basis for accomplishing this is contained in the *MAG ITS Strategic Plan.*

Figure 2
Current Base Highway Network Functional Classes

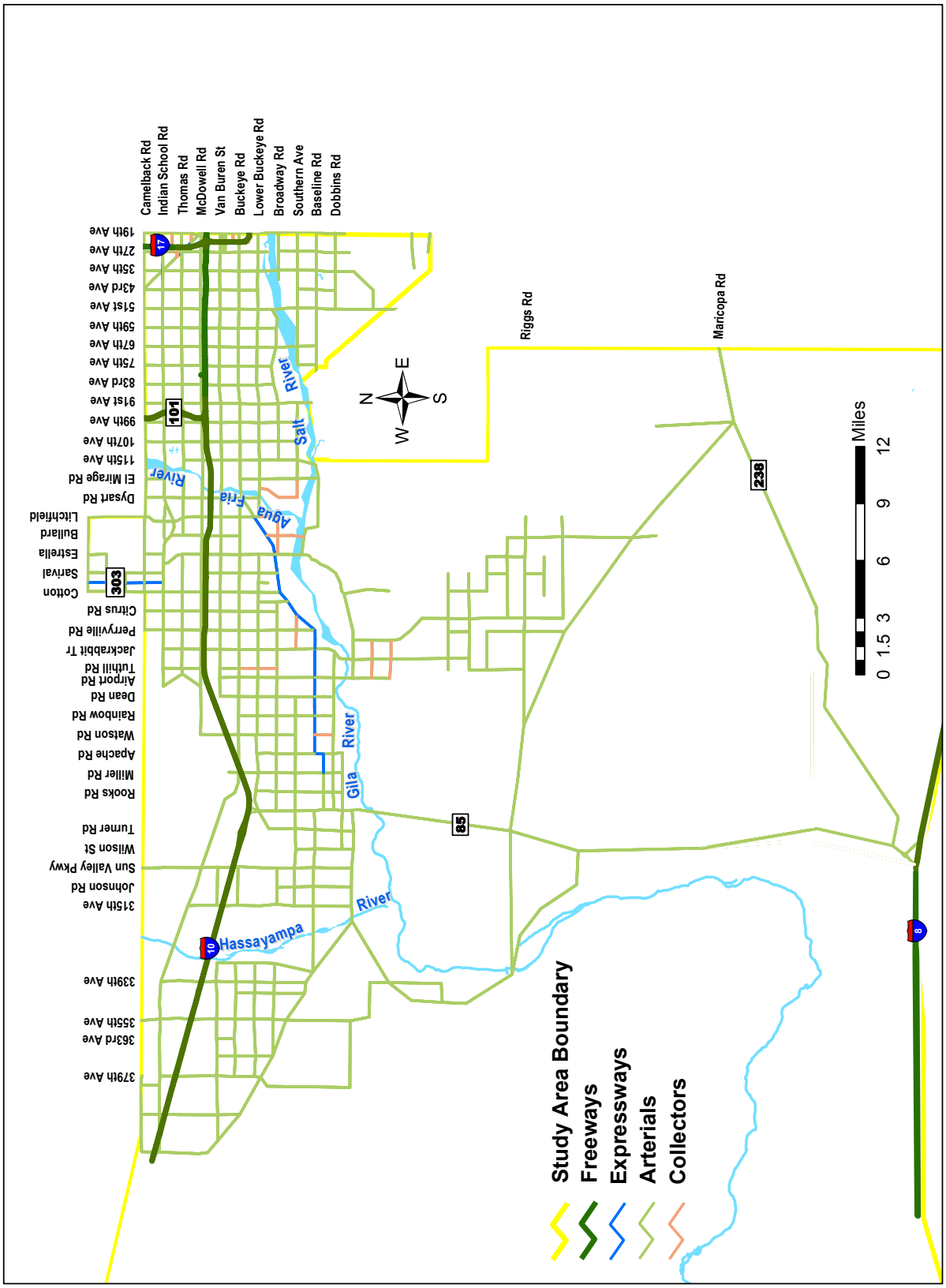


Table 5
Current (2002) Base Network Centerline Roadway Miles
by Functional Class and Area Type

Facility/Area Type	CBD	Urban	Urban Fringe	Suburban	Rural	Total
Freeway with HOV*	0.7	4.8	2.8	1.8	0.0	10.1
Freeway w/o HOV*	3.8	1.3	1.1	10.2	62.9	79.3
Expressway	1.1	0.9	0.0	0.0	19.0	21.0
Arterial	4.4	41.2	35.9	145.8	634.6	861.8
Collector	2.0	4.1	1.9	4.7	13.8	26.5
Total Classified	**12.0**	**52.4**	**41.6**	**162.4**	**730.3**	**998.8**
Unclassified						3,023.3
Total						**4,022.1**

*HOV: High Occupancy Vehicle Lane or "Carpool" Lane

Table 6
Current (2002) Base Network Road Lane Miles
by Functional Class and Area Type

Facility/Area Type	CBD	Urban	Urban Fringe	Suburban	Rural	Total
HOV* Lanes	1.5	9.6	5.7	3.5	0.0	20.3
Freeway w/o HOV*	22.3	44.2	24.3	71.9	251.7	414.3
Expressway	6.5	3.7	0.0	0.0	43.6	53.8
Arterial	21.9	206.3	156.3	458.8	1,355.3	2,198.7
Collector	7.0	12.5	7.5	12.3	29.6	69.0
Total Classified	59.2	276.3	193.8	546.5	1,680.2	2,756.0

*HOV: High Occupancy Vehicle Lane or "Carpool" Lane

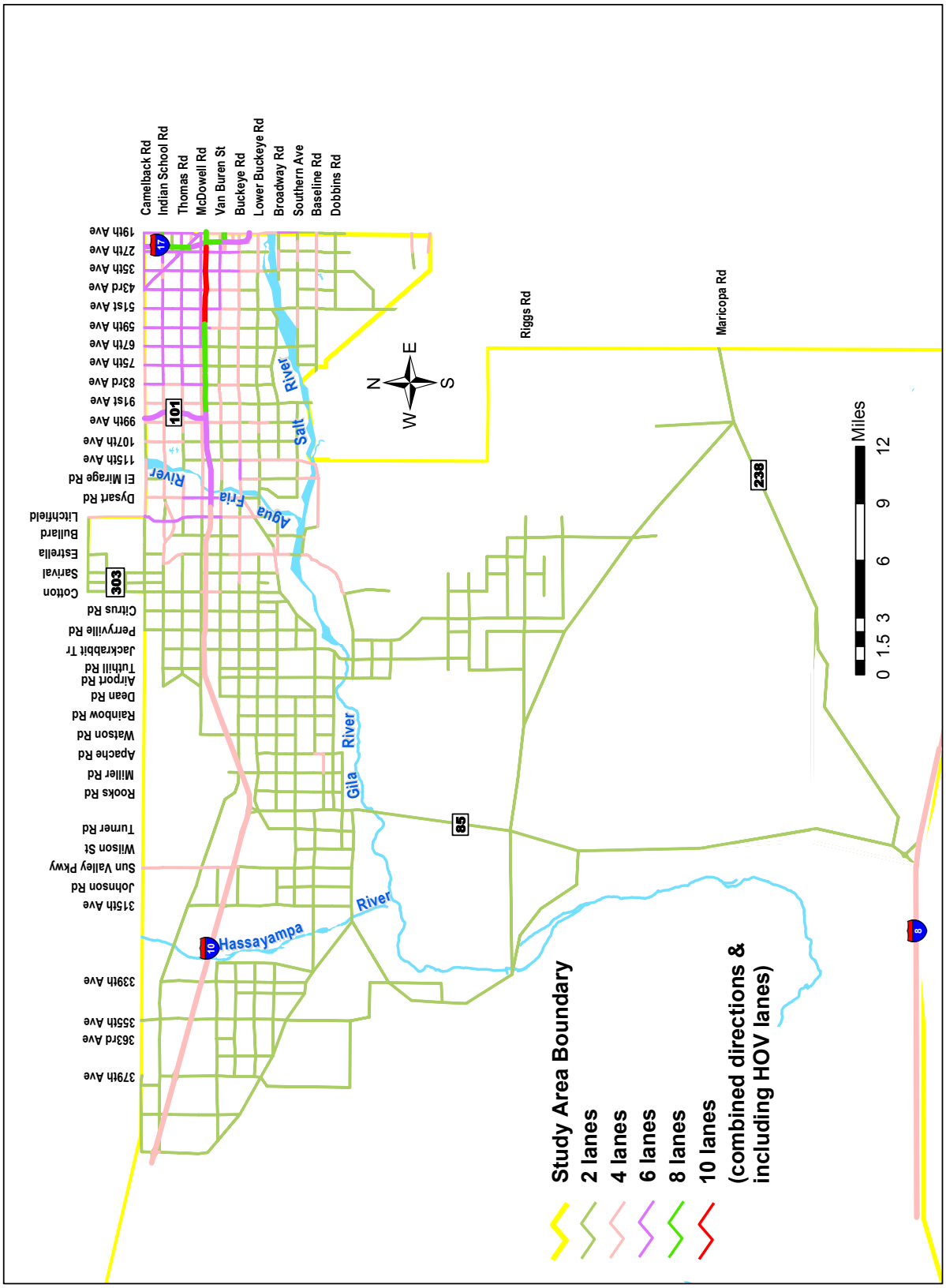
4.2 Planned Future Transportation Facilities

4.2.1 Future Roadways

Increased traffic demand in the study area will tax the existing roadway facilities in the near future. Facilities such as I-10 are already experiencing directional rush hour congestion and poor levels of service. Pressure is growing in the Southwest Valley to expand the current arterial grid network, upgrade and construct new river crossings, and plan and build for high capacity roadways.

Figure 6 displays the network projected as part of the existing MAG Long Range Transportation Plan (LRTP) (2002 Update). This "future base" network represents currently planned and committed projects. Much of the new arterial grid development is expected to be funded locally, primarily through development fees.

Figure 3
Number of Lanes in Current Base Network



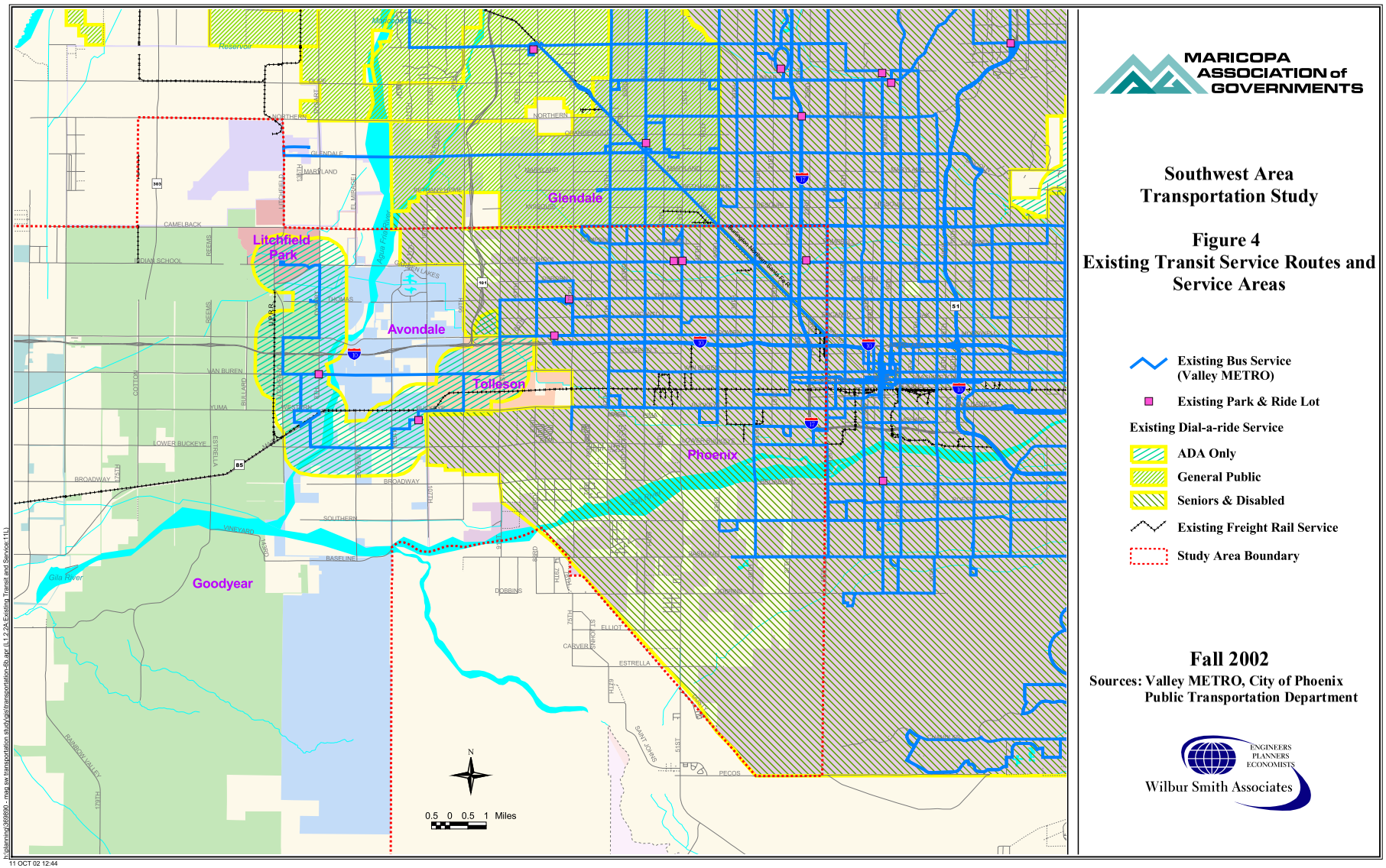

Litchfield Park
Glendale
Avondale
Tolleson
Phoenix
Goodyear
Gila River
Reservoir
N
0.5 0 0.5 1 Miles
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Figure 4
Existing Transit Service Routes and Service Areas
Existing Bus Service (Valley METRO)
Existing Park & Ride Lot
Existing Dial-a-ride Service
ADA Only
General Public
Seniors & Disabled
Existing Freight Rail Service
Study Area Boundary
Fall 2002
Sources: Valley METRO, City of Phoenix Public Transportation Department
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Figure 5
Existing Off-Road Non-Motorized Facilities

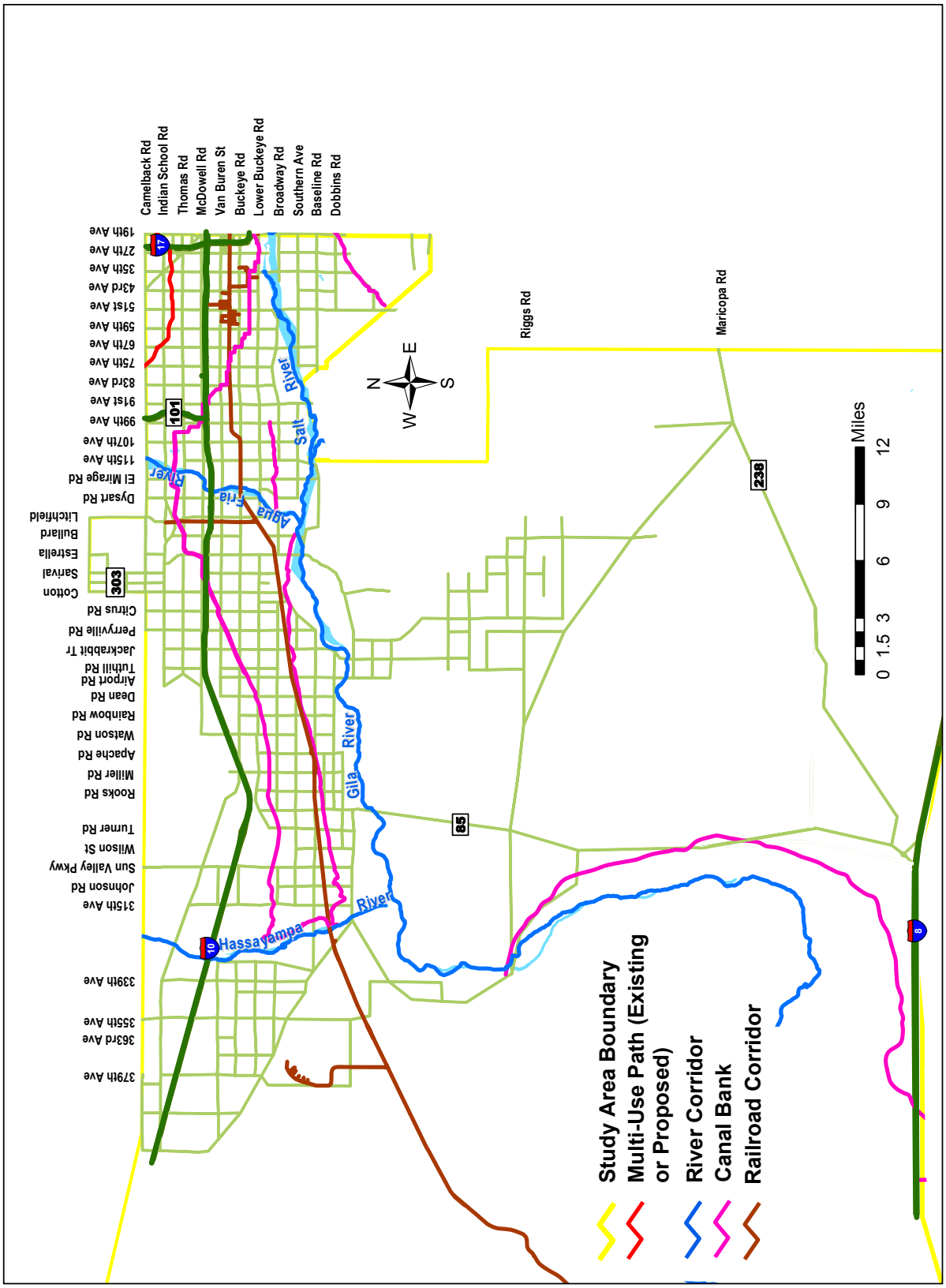
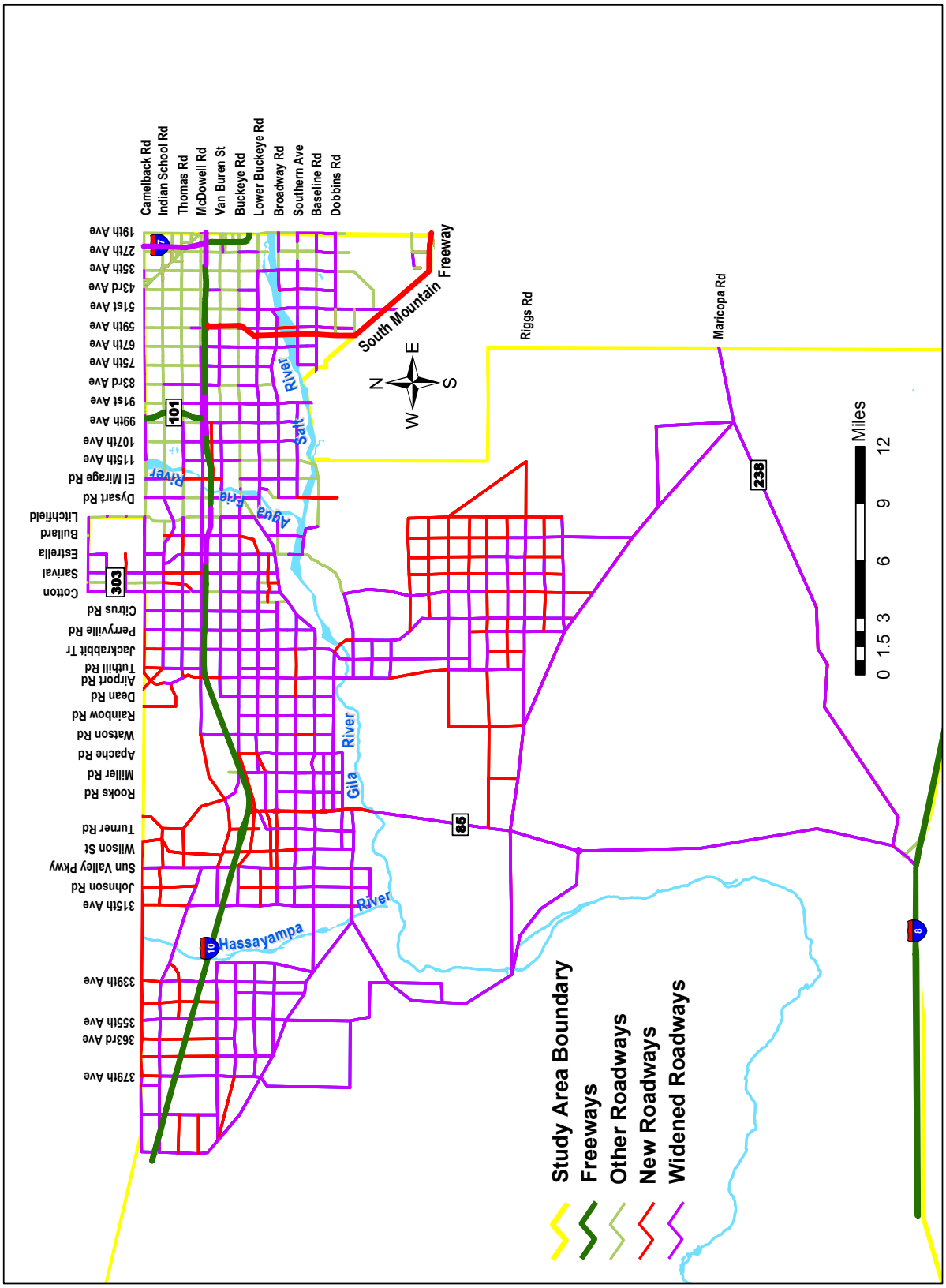


Figure 6
New and Widened Facilities in Future Base Network (As Modeled)



4.2.2 Future Transit Service

Additional transit facilities and services in the study area will be necessary. The current MAG LRTP (2002 Update) provides a tripling of local bus service, quadrupling of express bus service and BRT, and 29 miles of Light Rail Transit regionally. The RTS and HCT studies review options to further improve transit services across the region. The HCT and the RTS studies identify major improvements to transit services generally over and above the improved service already specified in the current LRTP.

4.2.3 Needed Future Non-motorized Facilities

For non-motorized uses, physical deficiencies most often take the form of gaps in the route or system and barriers within the route itself. Gaps can take the form of missing corridors, missing pieces within a corridor, and missing connections between on-street and off-street facilities. Examples of gaps in the study area are:

- Baseline Road from Southern Avenue to the Salt River;
- 2nd Avenue from Buckeye Road to Encanto Boulevard;
- Perryville Road from McDowell Road to the Salt River;
- Lower Buckeye to the Salt River Corridor; and,
- The Hassayampa River to the Salt/Gila Rivers corridor.

Barriers at a regional scale are usually present when an off-road or on-street facility comes up against a canal, riverbed, wash, freeway, or elevated railroad embankment. In the southwest area, barriers can be found at the intersections of:

- Paved routes and the Union Pacific Railroad (UP);
- Arterial streets and canals;
- Paved paths and I-10 and I-8; and
- Residential and commercial areas across SR 85 in Gila Bend.

Non motorized facilities are addressed in more detail in the main report.

5 Transportation Issues

Transportation issues to be studied in the Southwest Valley to be addressed by this study, were determined from a review of previous studies, solicitation with local agencies, stakeholders, the public and technical assessments by the study team.

Consultation with agencies, the public and stakeholders was a critical element of the study that helped identify and prioritize major transportation issues in the study area. The top ten issues identified and ranked by responses from these entities were as follows:

- Preserving/dedicating right-of-way for future corridors;
- Future transit service needs;
- Luke AFB and surrounding area;
- Funding I-10 improvements;
- Improvements to Loop 303 (including extensions);
- Bus pullout locations for future developments;
- HOV Lanes on I-10;
- The need to identify major arterial routes;
- Identification of bus and rail corridors; and
- I-10 capacity improvements.

The determination of the relative priority of issues was made using quantitative analysis of the interview and survey data, and assessments by the study team. The analysis

resulted in several issues that were generally important to all entities in the southwest region:

- Discontinuous Roadway Network: Accommodation of new pockets of development in an area that lacks connectivity to the rest of the metropolitan area due to geographical features and limited east-west arterials;
- Capacity deficiencies on existing regional roadways;
- New access points (interchanges) on I-10;
- Options to relieve traffic on I-10, particularly in congested sections;
- Lack of convenient transit services, and particularly for the perceived need for high capacity transit service such as light rail or commuter rail;
- Availability of funding for transportation infrastructure improvements; and,
- Right-of-way preservation.

A primary underlying concern is the ability to preserve corridors for future transportation infrastructure. These issues are discussed on more detail below.

5.1 Discontinuous Roadway Network

While a grid roadway system exists in the northeast quadrant of the study area and generally along the I-10 corridor, much of the southwest area is undeveloped with respect to roadway infrastructure. In many instances, the various local jurisdictions rely on land developers to complete the network. Many of the existing roads that provide connectivity to the metropolitan area are designed to funnel traffic to I-10, which has limited capacity to accommodate additional local development. Moreover, I-10 is a systems facility with a primary purpose of accommodating regional and national traffic, not local traffic.

Some communities and developments have adopted or proposed curvilinear neighborhood street systems, which are inconsistent with a grid system. Most of these developments are self contained with a street hierarchy that feeds into the regional grid network. This in turn limits the development of a regional grid system and creates additional congestion on the regional grid system.

5.2 Capacity Deficiencies

The need for additional capacity to accommodate the growth currently taking place in the southwest area, and the growth expected to come in future years has been recognized by virtually every agency responsible for transportation. Review of the future Base roadway network reveals that significant new lane construction is projected. Table 7 shows daily capacity by functional class for the current (2002) and Future Base networks.

As the table indicates, the current plan (Future Base Network) already provides a near-doubling of capacity overall. While capacity will increase for every classification, there will still be a need for additional capacity, particularly for roadways that are more significant regional facilities (freeways and expressways) given the rapid growth in the area.

5.3 New Freeway Interchanges

The development expected to take place in the southwest area will create the need for additional freeway access. New interchanges on I-10 were identified in the study process as particularly important. The locations on I-10 are as follows:

- El Mirage Road (depending on local plans for development);

Table 7
Capacity Miles by Functional Class

Facility Type	Lane Capacity (vehicles per day)	Current 2002 Base Network Capacity Miles	Future Base Network Capacity Miles	Percent Increase
HOV** Lanes	21,000	426,090	2,564,940	602
Freeway w/o HOV**	21,000	8,700,720	11,318,370	130
Expressway	21,000	1,129,800	3,171,420	281
Arterial	8,000	17,589,200	37,260,400	212
Collector	8,000	551,600	568,480	103
Total Classified		**28,397,410**	**54,883,610**	**193**

*Capacity miles is lane miles multiplied by daily vehicle capacity per lane of 21,000 for freeways and expressways and 8,000 for all other types.
**HOV: High Occupancy Vehicle Lane or "Carpool" Lane

- Bullard Avenue;
- Perryville Road;
- Wilson Street;
- Johnson Road; and
- 355th Avenue/Wickenburg Road (CANAMEX Corridor).

5.4 East-West Reliever

I-10 is the primary artery connecting the vast undeveloped and partially developed properties in the southwest area. While there is a need for additional capacity on I-10, there are also a practical number of lanes that can be constructed to meet the demand, both in terms of right-of-way and practical operation.

Broadway Road was the most mentioned location for a high capacity reliever roadway to I-10. Such a facility would extend from SR 85 on the west to I-17 or Rio Salado Parkway on the east.

5.5 Transit Needs for the Study Area

There is a need for expanded transit service in the study area. Not only will transit service provide some relief to traffic congestion, it also is important to provide alternative means of mobility to an aging population. The effort in the SWATS involved considerable coordination with a concurrent High Capacity Transit Study (HCTS) by MAG as well as a concurrent Regional Transit Study (RTS) conducted by Valley Metro (RPTA). Recommendations in those two studies for the southwest area will be considered in the RTP.

5.6 Right-of-Way Preservation

Corridor preservation is the first action in the corridor management process. The American Association of State Highway and Transportation Officials (AASHTO) defines corridor preservation as a "concept utilizing the coordinated application of various measures to obtain control of or otherwise protect right-of-way for a planned transportation facility".

5.7 Aviation

Aviation topics are covered in the MAG *Regional Aviation System Plan.*

6 Evaluation of Alternatives

From the transportation issues developed, several options or alternatives were identified for evaluation leading up to recommendations for input to the RTP for consideration. As part of this process, four different highway options were evaluated.

2020 (LRTP Based) Reference Network ("Future Base"). This network represents the current MAG LRTP 2002 Update which will be superceded by the new RTP. Improvements include road and transit projects currently in the LRTP and local arterial projects expected to be implemented based on existing plans of local jurisdictions and private developers;

Enhanced Network. This option includes the facilities in the Future Base network plus additional improvements to the existing freeways, including HOV lanes on I-10 west of Loop 101, on I-17 south of I-10, and on Loop 101. This scenario also assumes existing freeway and expressway facilities (I-10, I-17, Loop 101) built out within the limits of existing right-of-way and structures.

New Corridors Options A and C. These networks represent the third and fourth options evaluated for the SWATS. (Modeling for the southwest, northwest, and southeast area studies was conducted jointly. Three alternative networks for new highways were considered, referred to as Options A, B, and C. Option B did not involve new facilities for the SW Valley so is not reviewed here.) Options A and C include a number of potential new highways in the study area:

- An I-10 Reliever, i.e., a freeway running parallel to and south of I-10 from I-17 near the eastern boundary of the study area to I-10 west connecting at the CANAMEX Corridor (355th Ave.);
- A Loop 101 extension (five lanes in each direction) from I-10 to the new I-10 Reliever;
- The Rio Salado Parkway (three lanes in each direction) from downtown Phoenix to the I-10 Reliever at the Loop 101 extension;
- Loop 303 is upgraded north of I-10 from the four-lane expressway included in the Future Base network to a freeway;
- An extension of Loop 303 south of I-10 to Riggs Road; and
- The Riggs-Komatke and Maricopa Road arterial roadway corridors (three lanes in each direction) east of SR 85 to the study area boundary, overlapping Riggs Road and Loop 303 in southern Goodyear.

Also included are widenings of I-17, which is on the perimeter and has limited impact on the SWATS study area. Options for I-17 are addressed in detail in the NWATS and the RTP.

The major difference between Option A and Option C is the number of lanes on the I-10 Reliever and on Loop 303 south of the I-10 Reliever. In Option A, the I-10 Reliever is assumed to be six lanes in each direction for its entire length. In Option C, to better match demand, the I-10 Reliever has seven lanes at its eastern end, four lanes between Loop 303 and SR 85, and three lanes at its western end.

Loop 303 has five lanes in Option A for its entire length. In Option C, Loop 303 has six lanes south of the I-10 Reliever to Riggs Road.

Table 8 shows a summary comparison of the various network options evaluated. Maps

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Table 8
Network Performance Comparisons*

	Network								
Year	2002	2020				2030			
Network	Current Base	Future Base	Enhanced	New Corridor Option A	New Corridor Option C	Future Base	Enhanced	New Corridor Option A	New Corridor Option C
Centerline Miles									
Freeway	108	128	128	218	218	128	128	218	218
Expressway	21	43	50	90	90	43	50	90	90
Arterial	865	1,119	1,109	1,057	1,057	1,119	1,109	1,057	1,057
Collector	27	20	22	22	22	20	22	22	22
Total	1,021	1,310	1,309	1,387	1,387	1,310	1,309	1,387	1,387
Lane Miles									
Freeway	585	634	935	1,999	1,869	634	935	1,999	1,869
Expressway	54	184	276	526	526	184	276	526	526
Arterial	2,204	4,658	4,608	4,423	4,432	4,658	4,608	4,423	4,432
Collector	69	74	84	84	84	74	84	84	84
Total	2,913	5,550	5,903	7,032	6,912	5,550	5,903	7,032	6,912
Capacity Miles**									
Freeway	12,293,610	13,307,910	13,307,910	19,717,530	19,626,390	13,307,910	13,307,910	19,717,530	19,626,390
Expressway	1,129,800	3,854,760	3,854,760	5,794,320	5,794,320	3,854,760	3,854,760	5,794,320	5,794,320
Arterial	17,632,320	37,265,600	37,265,600	36,864,480	36,864,480	37,265,600	37,265,600	36,864,480	36,864,480
Collector	554,880	592,800	592,800	672,800	672,800	592,800	592,800	672,800	672,800
Total	31,610,610	55,021,070	55,021,070	63,049,130	62,957,990	55,021,070	55,021,070	63,049,130	62,957,990
Daily Vehicle Miles of Travel									
Freeway	6,958,146	11,586,434	14,420,107	27,269,662	27,484,309	14,188,130	18,446,314	37,820,996	37,545,683
Expressway	388,532	2,663,287	2,854,555	3,106,447	3,598,702	3,038,593	3,890,479	5,646,793	5,603,736
Arterial	6,870,346	22,435,342	19,190,450	12,290,813	12,520,980	34,870,689	30,748,799	20,910,225	21,245,244
Collector	86,303	350,646	302,706	224,848	256,971	452,913	458,313	337,952	359,209
Total	14,303,326	37,035,709	36,767,818	42,891,770	43,860,963	52,550,326	53,543,906	64,715,966	64,753,872
Daily Truck Vehicle Miles of Travel									
Freeway	1,951,141	3,182,836	4,065,007	7,107,940	7,160,477	3,974,190	5,299,251	9,572,807	9,462,723
Expressway	102,628	961,038	1,038,715	1,152,828	1,328,326	1,041,947	1,361,063	1,925,822	1,924,482
Arterial	1,692,490	5,160,140	4,234,261	2,461,570	2,530,692	7,849,686	6,581,317	4,454,160	4,541,169
Collector	17,810	81,358	71,873	47,606	54,609	112,593	112,542	79,408	83,001
Total	3,764,070	9,385,372	9,409,857	10,769,944	11,074,104	12,978,416	13,354,174	16,032,197	16,011,375
Evening Peak Hour Vehicle Miles of Travel									
Freeway	337,282	616,052	798,620	1,441,343	1,450,840	708,938	1,013,414	2,022,321	2,014,484
Expressway	22,013	113,879	106,401	114,382	127,615	140,093	162,693	240,572	236,049
Arterial	400,007	1,276,556	1,131,467	768,189	781,498	2,039,333	1,841,064	1,264,034	1,279,598
Collector	6,106	19,024	17,366	15,100	15,075	25,425	24,876	20,980	21,376
Total	765,409	2,025,510	2,053,855	2,339,014	2,375,027	2,913,789	3,042,047	3,547,906	3,551,506
Evening Peak Hour Average Vehicle Speeds									
Freeway	53	42	50	54	54	35	41	46	44
Expressway	42	39	43	44	44	27	36	42	42
Arterial	30	27	29	30	30	22	24	27	27
Collector	25	22	22	23	23	18	20	22	22
Directional Highway Miles under Congested Conditions (Level-of-Service E or F†) in the Evening Peak Hour									
Freeway	6	48	20	6	11	79	68	53	50
Expressway	1	4	4	0	0	52	19	8	8
Arterial	68	201	119	37	41	609	488	139	138
Collector	0	2	2	1	1	9	7	3	3
Total	75	255	145	44	53	749	582	202	199
Percent of Directional Highway Miles under Congested Conditions (Level-of-Service E or F†) in the Evening Peak Hour									
Freeway	3	19	8	1	3	31	27	12	11
Expressway	2	5	4	0	0	60	19	4	4
Arterial	4	9	5	2	2	27	22	7	7
Collector	1	5	4	3	2	24	15	6	6
Total	4	10	6	2	2	29	22	7	7
Evening Peak Hour Vehicle Miles of Travel under Congested Conditions (Level-of-Service E or F†)									
Freeway	34,943	204,265	114,791	33,226	59,715	708,938	1,013,414	2,022,321	2,014,484
Expressway	1,598	9,568	8,268	0	0	140,093	162,693	240,572	236,049
Arterial	52,198	347,440	204,723	63,617	73,395	2,039,333	1,841,064	1,264,034	1,279,598
Collector	212	1,829	2,511	941	1,325	25,425	24,876	20,980	21,376
Total	88,951	563,103	330,293	97,784	134,436	2,913,789	3,042,047	3,547,906	3,551,506
Percent of Evening Peak Hour Vehicle Miles of Travel under Congested Conditions (Level-of-Service E or F†)									
Freeway	10	33	14	2	4	51	37	19	17
Expressway	7	8	8	0	0	66	27	8	8
Arterial	13	27	18	8	9	53	45	18	18
Collector	3	10	14	6	9	39	24	10	10
Total	12	28	16	4	6	53	41	18	17
Evening Peak Hour Intersections under Congested Conditions (Level-of-Service E or F†)									
East Subarea***	22	107	90	48	55	227	231	239	239
Central Subarea***	0	25	14	3	3	189	193	177	177
West Subarea***	0	0	0	0	0	142	146	142	142
South Subarea***	0	2	2	0	0	88	88	79	79
Percent of Intersections under Congested Conditions (Level-of-Service E or F†) in Evening Peak Hour									
East Subarea***	12	47	39	20	23	69	62	41	40
Central Subarea***	0	13	7	2	2	68	55	17	18
West Subarea***	0	0	0	0	0	3	3	1	1
South Subarea***	0	2	2	0	0	13	11	5	5
Motor Vehicle Accidents - Annual									
Freeway Fatal	22	33	38	53	51	36	42	63	62
Freeway Injury	1,418	2,298	2,644	3,781	3,649	2,516	2,949	4,670	4,562
Freeway PDO****	3,480	5,668	6,521	9,340	9,012	6,209	7,277	11,559	11,292
Freeway Subtotal	4,920	7,999	9,203	13,174	12,712	8,761	10,268	16,292	15,916
Other Segment Fatal	74	148	142	121	123	192	184	155	156
Other Segment Injury	6,699	13,717	12,756	11,149	11,295	17,972	16,709	14,299	14,380
Other Segment PDO****	13,361	27,406	25,534	22,328	22,639	35,892	33,478	28,712	28,901
Other Segment Subtotal	20,134	41,271	38,432	33,598	34,057	54,056	50,371	43,166	43,437
Intersection	15,219	23,083	22,869	20,737	20,838	26,411	25,878	23,054	23,228
Total	40,273	72,353	70,504	67,509	67,607	89,228	86,517	82,512	82,581

*Results are preliminary given the interim nature of the underlying socioeconomic data and are subject to change in the RTP process.
**Capacity Miles: lane miles multiplied by daily vehicle capacity per lane of: 21,000 for freeways and expressways; 8,000 all other types
***Subareas: East is east of the Agua Fria River; central is west of the Agua Fria River, east of SR-85, and north of the Gila River; south is south of the Gila River and west of the Agua Fria River; west is west of SR-85.
****PDO: Property Damage Only
†Level-of-Service E and F are highly congested or jammed conditions. Level A is freeflow. Levels B to D are progressively deteriorating traffic service.

presenting detailed results are included in the main report. Operationally, the table shows that there is considerably more travel under Options A and C than under either the Future Base or Enhanced networks. This is because both Options A and C have extensive freeway and expressway systems, which are more conducive to travel.

Both Options A and C have less congestion than the other two alternatives, the result of more capacity being provided in the roadway network. Options A and C have approximately five percent fewer accidents than either the Future Base or Enhanced networks.

7 Recommendations for Ultimate Concepts

Based on the evaluation of various alternatives and considering agency, stakeholder and public input, conclusions and recommendations for the ultimate transportation facilities in the southwest region were developed and are presented below. Specific alignments and design elements (including number of lanes) of facilities are not established in the SWATS. Detailed location and design studies will be conducted for facilities funded in the RTP.

All cost estimates are preliminary and will be refined or superseded by estimates for the RTP.

7.1 Highway Facilities

7.1.1 Arterials

Figure 7 shows the recommended arterial network. It is recommended that the basic grid configuration of the existing arterial system be continued as the area develops, with a four lane arterial the minimum standard for the ultimate system.

The arterial system will be implemented by local jurisdictions. Therefore, it is subject to change following further study, particularly in Goodyear where arterial planning is on-going. For example, the locations of the Arterial Roadway Corridors (ARCs) shown in Figure 7 could change or the arterial system serving the Estrella Mountain Ranch development could be updated. The phasing of improvements is dependent on both land development and traffic demand, with the private sector typically responsible for financing implementation of those arterials necessitated by private development. In total, the estimated cost of the arterial improvements is slightly more than $3.6 billion.

In addition to new arterial lane miles, new arterial river crossings, replacement bridges, and widening of existing bridges will be needed. Three new major river crossings on existing arterials are recommended for:

- Rainbow Valley Road over the Gila River;
- Thomas Road over the Agua Fria River; and
- Camelback Road or Tonopah-Salome Highway over the Hassayampa River.

The Camelback Road or Tonopah-Salome Highway bridge over the Hassaympa River could be funded by nearby land developers. An arterial bridge at 59th Avenue to serve local traffic may also be needed ultimately, especially if the final location determined in the ongoing Design Concept Study for the South Mountain Freeway is not in the 59th Avenue corridor. Additional crossings will also be needed where new highways are specified. Table 9 presents a summary of arterial river crossings and estimates needs for improvements at both existing crossings and new crossings. Figure 8 graphically portrays the river crossings. In total, the estimated cost of all recommended river crossing improvements is $239 million.

Figure 7
Ultimate Concept for Lanes on the Arterial Network

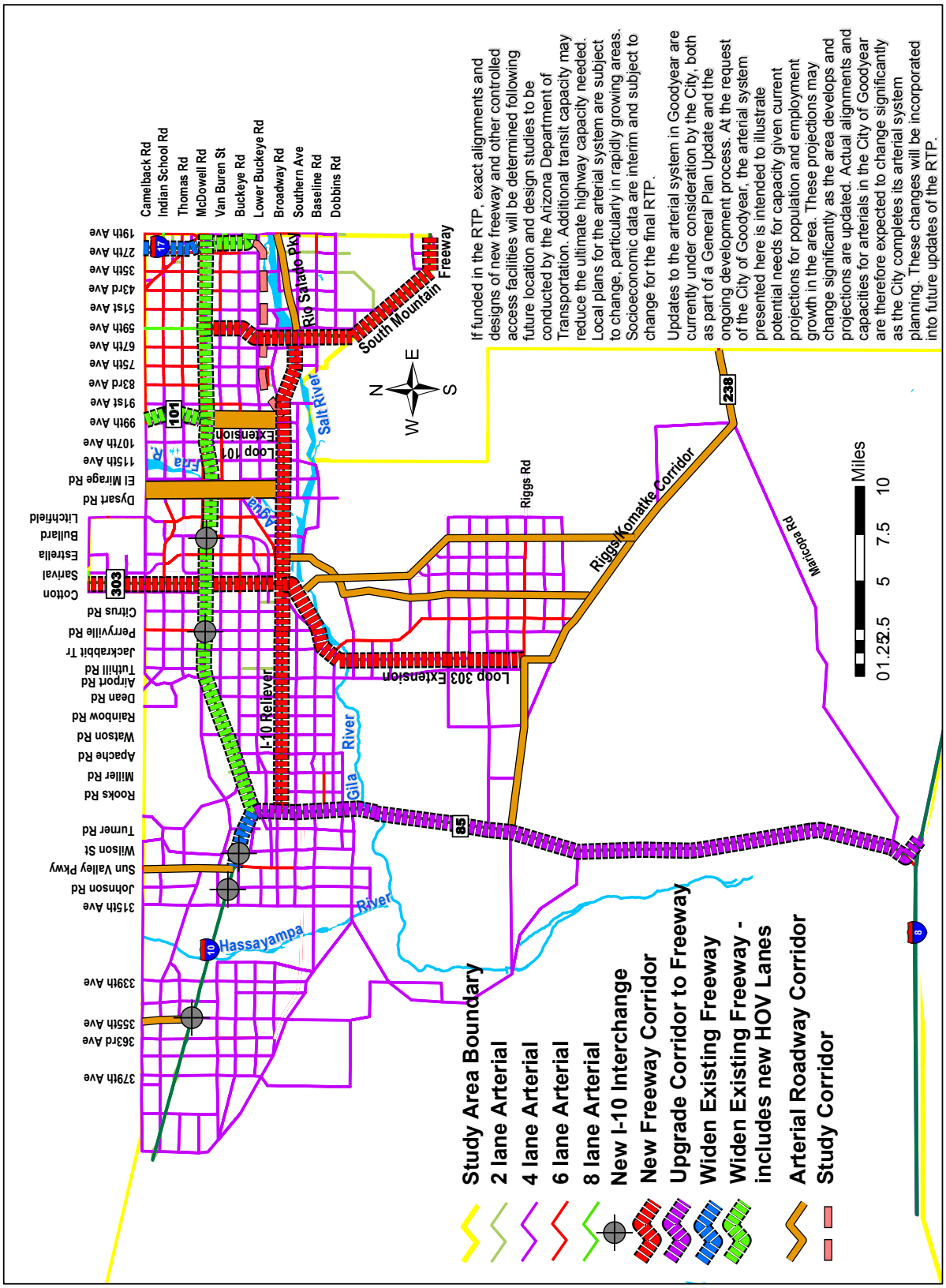


Table 9
Arterial Crossings of Major Rivers: Improvements and Cost Estimates*

Road	River	Current Lanes	Future Lanes	Added Lanes	Current Condition	Action	Cost
19th Ave	Salt	4	4	0	Not	None	
35th Ave	Salt	2	4	2	Deficient	Build	$4.7
51st Ave	Salt	2	4	2	Not	None	
59th Ave	Salt	0	4	4	No Crossing	Build	9.4
67th Ave	Salt	2	4	2	Road	Build	9.4
91st Ave	Salt	2	4	2	Road	None	
115th Ave	Gila	4	4	0	Not	None	
El Mirage	Gila	4	4	0	Road	Build	46.8
Bullard	Gila	2	4	2	Not	Widen	7.3
Estrella	Gila	2	4	2	Not	Widen	11.5
Rainbow Valley	Gila	0	4		No Crossing	Build	24.0
Tuthill	Gila	2	4	2	Not	Widen	8.3
Airport	Gila	2	4	2	Road	Build	18.7
Old US 80	Gila	2	4	2	Deficient	Build	15.6
Camelback	Agua Fria	4	4	0	Not	None	
Indian School	Agua Fria	4	4	0	Deficient	Build	15.2
Thomas	Agua Fria	0	6		No Crossing	Build	13.6
McDowell	Agua Fria	4	6	2	Not	Widen	5.8
Van Buren	Agua Fria	4	6	2	Not	Widen	3.1
MC-85	Agua Fria	4	4	0	Not	Build	11.3
Lower Buckeye	Agua Fria	2	4	2	Road	Build	23.4
Tonopah	Hassayampa	2	4	2	Road	Build	11.0
Baseline	Hassayampa	2	4	2	Road	None	
Old US 80	Hassayampa	2	4	2	Not	None	
Total							**$239.0**

*This table mainly reflects improvements to existing bridges. Additional roadways may need bridges. These estimates are preliminary and may be superseded by the RTP.

7.1.2 Freeways and Expressways

To meet future demand, a substantial increase in freeway and expressway miles will be needed. (See Figure 9.) Figure 10 shows the number of freeway and expressway lanes needed to serve traffic forecasts for 2030, based on interim population and employment forecasts. Demand projections will differ somewhat for the new socioeconomic data developed for the RTP. Alignment and design studies to be conducted by the Arizona Department of Transportation focused on each specific facility may have different design years, use updated population and employment forecasts, or include more detailed cost estimation resulting in changes to the recommendations included here. The current estimate of total cost of the freeway and expressway improvements recommended here is approximately $6.9 billion.

Figure 8
Recommended Bridge Actions at Major River Arterial Crossings

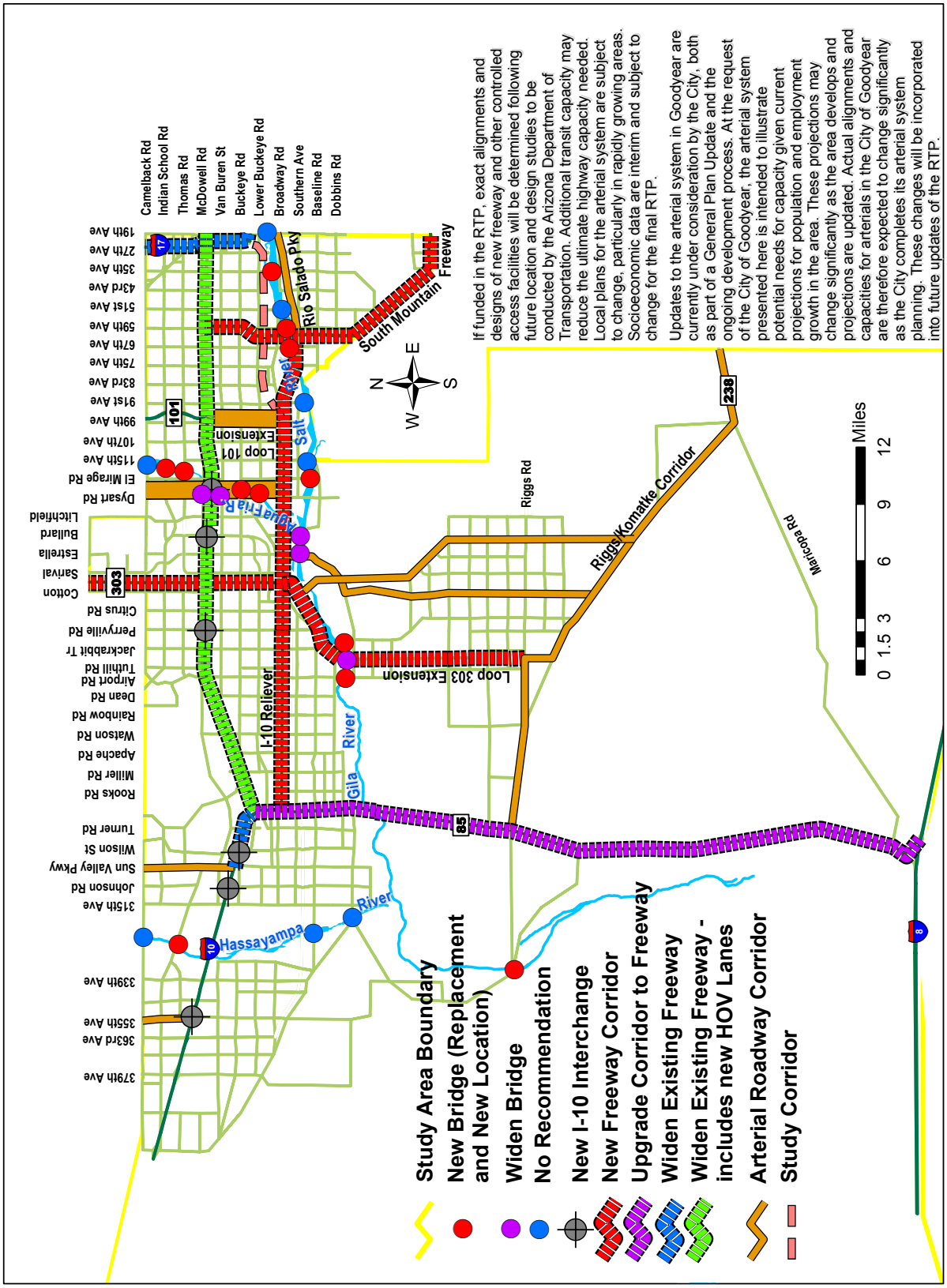


Figure 9
Ultimate Concepts for Major Highway Infrastructure Based on 2030 Demand Estimates

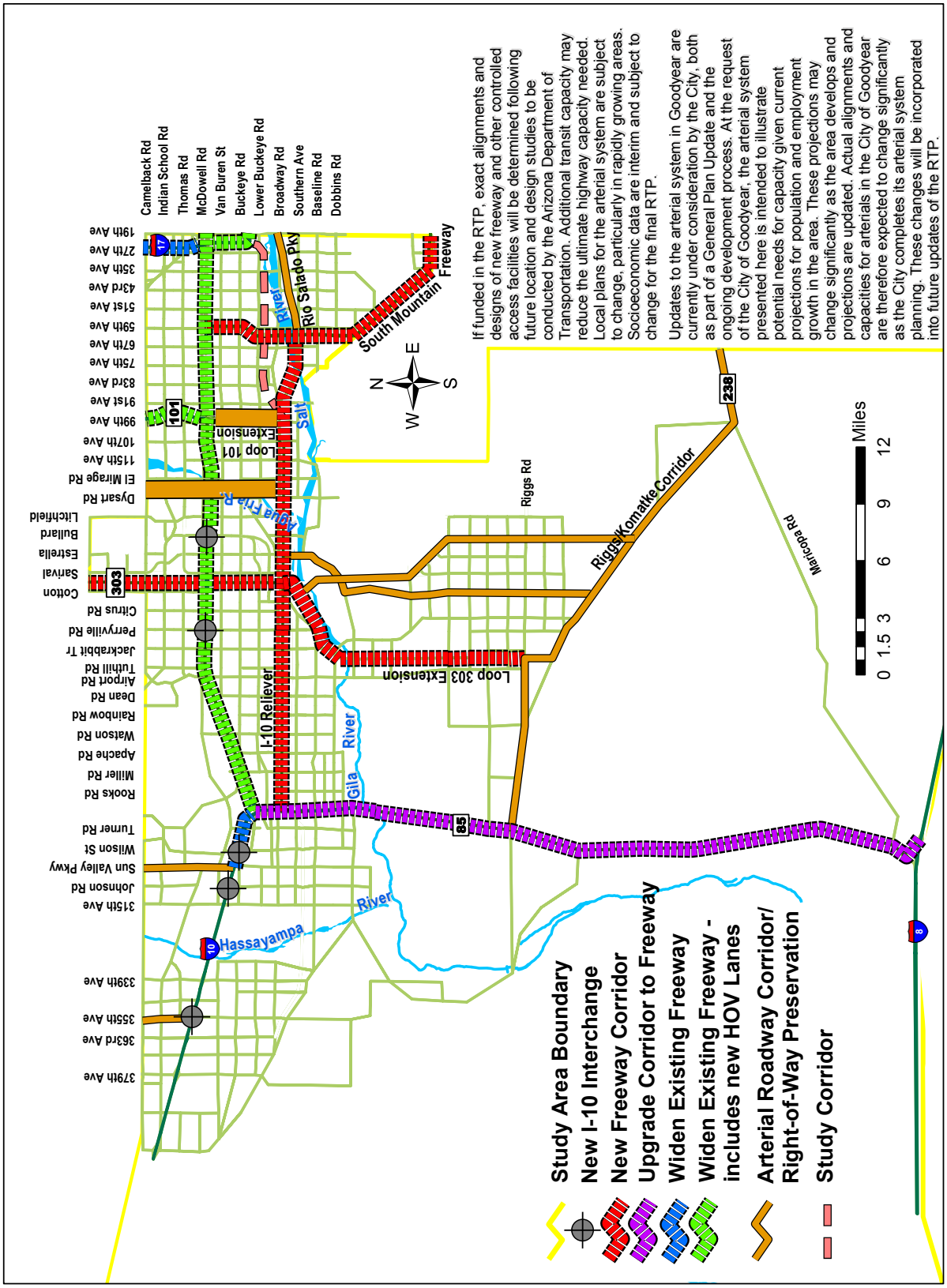
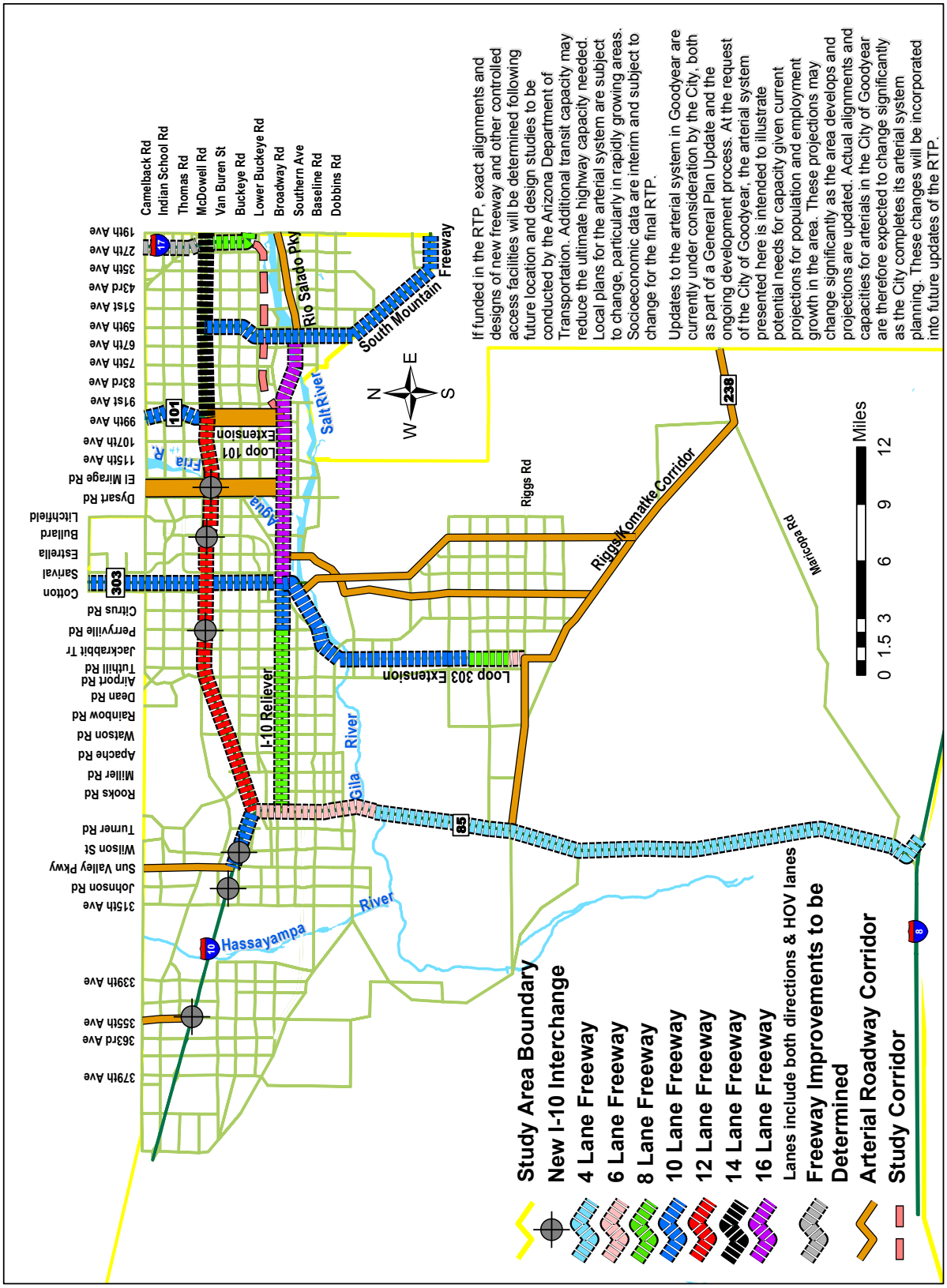


Figure 10
Ultimate Concepts for Major Highway Infrastructure: Lanes Needed Based on 2030 Demand Estimates



7.1.3 I-10

To meet the future systems demand, as well as to provide local connections and connections to other parts of the region, I-10 will require widening. East of Loop 101, demand is projected for 14 lanes (10 general purpose lanes and four HOV lanes). West of Loop 101, demand is projected for up to 12 lanes to SR 85, with 10 general purpose lanes and two HOV lanes. West of SR 85, demand is projected for 10 lanes to Sun Valley Parkway. West of Sun Valley Parkway facility needs are not forecast to exceed the current capacity.

In concert with ongoing work involving ADOT and local and regional entities, six new arterial interchanges are included in the plan:

- El Mirage Road (depending on local development plans);
- Bullard Road;
- Perryville Road;
- Wilson Avenue;
- Johnson Road; and
- 355th Avenue (future CANAMEX Corridor).

In total, improvements to I-10 are estimated to cost approximately $1.5 billion.

7.1.4 I-10 Reliever

A major project is a new facility to act as an I-10 reliever. This facility would be located to the south of I-10 between SR 85 and at a minimum the eastern boundary of the study area (I-17). A connection to I-10 at US 60 (Superstition) should also be studied. Demand is projected for up to a 14-lane facility east of the South Mountain Freeway, a 16-lane facility west of the South Mountain Freeway to the Loop 303 Extension, a 10-lane facility between the Loop 303 Extension and Perryville Road, and an eight-lane facility west to SR 85. The estimated cost of the I-10 Reliever within this study area is approximately $2.3 billion.

7.1.5 I-17

HOV or "carpool" lanes are needed along I-17 south of I-10 west. The portion of the carpool lanes west of 19th Avenue in the SWATS area is estimated to cost $33 million. North of I-10 west I-17 requires additional capacity, but the configuration of that capacity requires further study. A total of $230 million has been set aside for improvements along the section of I-17 north of I-10 to Camelback Road (the SWATS area boundary). Additional study will be required before decisions can be made with respect to improvements in this corridor.

7.1.6 Loop 101 (Agua Fria)

Loop 101 north of I-10 is recommended for widening. Forecast demand is projected for an additional general purpose lane as well as an HOV or "carpool" lane in each direction. The cost of these improvements for the portion of Loop 101 in the SWATS area is estimated at $81 million.

7.1.7 Loop 101 (Agua Fria) Extension

While a 10-lane freeway facility from I-10 south to the I-10 Reliever appears to be warranted based on demand, this roadway will require more study before the type of facility and number of lanes can be decided, given concern over potential local impacts. At this time, a parkway facility or higher level arterial facility acceptable to local jurisdictions is recommended for consideration in the RTP.

It should also be noted that the Loop 101 Extension is being considered among the alternatives in the South Mountain Freeway study ongoing at ADOT. The Loop 101 Extension as a 6-lane parkway would cost approximately $39 million.

7.1.8 Loop 202 (South Mountain Freeway)

The South Mountain Freeway is currently under study by ADOT. Based on the analysis performed in the SWATS, demand is projected for up to 10 lanes. The cost of the

portion of the South Mountain Freeway within the study limits was estimated to be $853 million.

7.1.9 Loop 303 (Estrella) Extension

The Loop 303 Extension includes implementation of a freeway on the alignment of existing Loop 303 and extending the facility across I-10 and the Gila River into the southern portion of Goodyear. An exact alignment is not recommended herein but would be determined following further study by ADOT. Demand is projected for up to 10 lanes along the route with a diminishing number of lanes as the facility approaches its southern terminus at Riggs Road. The Loop 303 Extension improvements in the SWATS area are estimated to cost approximately $1.34 billion.

It should be noted that commercial traffic volumes on the Loop 303 Extension are projected to be a substantial percentage of the total traffic. High projected levels of commercial traffic on a facility like Loop 303 does not make it ideal for a location within a major residential area.

7.1.10 SR 85

SR 85 is recommended ultimately to be a six-lane freeway from I-10 to I-8 to address demand and potential safety concerns. In the interim, it may be constructed as a freeway for the northern- most section from I-10 to the Gila River crossing. Between the Gila River and Komatke Road, demand is forecast for a six-lane expressway. South of Komatke Road (to Gila Bend), demand is forecast for a four-lane expressway. A cost of $253 million is estimated for these interim improvements to SR 85. SR 85 is currently being widened to a four-lane divided Highway. SR 85 is a segment of the CANAMEX Corridor, as recommended by MAG. The full cost of a freeway facility from I-10 to I-8 is estimated at about $1.2 billion.

7.1.11 Sun Valley Parkway

Traffic forecast for the Sun Valley Parkway is projected for six lanes. The facility is currently a 4 lane divided arterial. It is recommended that this road be upgraded to an expressway or parkway. The estimated cost of the improvements is $32 million (within the SWATS area, south of Camelback Road).

7.1.12 CANAMEX Corridor

The CANAMEX Corridor is one of 43 national "high priority" corridors identified in the Intermodal Surface Transportation Efficiency Act (ISTEA); the 1995 National Highway System (NHS) Designation Act; and the Transportation Efficiency Act for the 21st Century (TEA-21). It was conceived as a major commercial and trade route between Mexico and Canada.

In April of 2001, following completion of a study, the MAG Regional Council passed a resolution specifying the corridor within Maricopa County to include: I-8, SR 85, I-10 from SR 85 to the Wickenburg Road/Vulture Mine Road connection, an alignment in the general vicinity of Wickenburg Road/Vulture Mine Road connecting to the future Wickenburg Bypass, and the Wickenburg Bypass from that point west to US 93. Wickenburg Road is generally aligned with 355th Avenue at I-10.

Early preservation of right-of-way is recommended for the portion of the route north of I-10 and within the SWATS area. The route would connect to I-10 at or near 355th Avenue. It is recommended that right-of-way preservation be undertaken as part of the land development process. Costs and improvements to SR 85 and I-10 are included in this study. Costs for improvements for the CANAMEX Corridor north of the SWATS area are included in the NWATS.

7.1.13 Rio Salado Parkway

The Rio Salado Parkway, a six lane roadway proposed by the City of Phoenix, enters the study area from downtown Phoenix and parallels the Salt River to 75th Avenue, then turns north to an interchange with the I-10 Reliever and the Loop 101 Extension. The cost of the Rio Salado Parkway included in the SWATS study area is approximately $41 million.

7.1.14 Riggs, Komatke, and Maricopa Roads

It is recommended that right-of-way be preserved for this corridor to provide for a six-lane arterial or expressway. No costs are included for right-of-way preservation, as it is recommended that right-of-way preservation be undertaken as part of the land development process. Development of this corridor further east along Riggs Road is an alternative.

7.2 Transit

7.2.1 Regional Fixed Route Transit

The RTS recommends that service area expansion be included in the RTP. The implementation is recommended to be phased in concert with the expansion of development. An investment of $700 million will be needed for the rolling stock to serve the municipalities in the SWATS area. (This estimate includes 100% of those municipalities only partially located in the SWATS area.)

7.2.2 High Capacity Transit

The HCTS recommends corridors for LRT or BRT service on dedicated rights-of-way be included in the RTP. The HCTS recommends such facilities parallel to 51st and 59th Avenues north of Baseline Road and also along the I-10 corridor west of downtown Phoenix to Loop 101. These estimated cost of these facilities, if developed as LRT, totals $1.1 billion Commuter rail along the Union Pacific Railroad tracks from downtown Phoenix to Buckeye is also recommended by the HCTS for inclusion in the RTP with an estimated cost of $450 million. Additionally, the HCTS recommends BRT on I-10 west of Loop 101 and on Loop 101 and Loop 303 north of I-10.

7.2.3 Other Transit Facilities

The RTS recommends three additional park-and-ride facilities for the study area. These facilities should be phased such that they are in place ahead of development. All of these facilities are located along I-10 at strategically selected interchanges, at Litchfield Road, Miller Road, and 339th Avenue. These facilities cost approximately $3 million apiece.

7.3 Non-motorized Facilities

It is recommended that bicycle and pedestrian facilities be included in the RTP where feasible and consistent with regional and local plans. It is more cost effective to include the design and construction of bicycle and pedestrian facilities at the time of construction of new arterial roadways, as compared to subsequently widening an existing roadway to accommodate bicycle and pedestrian facilities.

7.4 Planned ITS

Intelligent transportation systems (ITS) are recommended for incorporation into transportation facilities and services consistent with the *MAG ITS Strategic Plan*. These include expansion of the existing freeway management system as freeway improvements are implemented, as well as traffic signal coordination along Arterial Roadway Corridors and other major arterial roadways. Capital costs for these improvements are currently estimated at $175 million.

7.5 Goods Movement

A large portion of the traffic in the study area is trucks moving goods within and through

the study area. Some municipalities in the study, such as Phoenix, have designated truck routes. Other cities do not. There is a concentration of freight terminals south of I-10 along Van Buren, Buckeye, and Lower Buckeye Roads. Interstate access coupled with growth in the greater Phoenix area indicates that truck freight movements in the study area will increase substantially in the coming years.

It is recommended that a region-wide systematic goods movement plan be prepared in preparation for future updates of the RTP. Because of the location of freight terminals south of I-10, truck traffic will be a substantial component of total traffic on the I-10 Reliever. A regional goods movement plan should be in place to inform the alignment and design studies for that and other facilities.

7.6 Summary of Costs

Table 10 shows a summary of costs for all facilities recommended for inclusion in the RTP. In total, over $12.9 billion worth of projects have been identified.

7.7 Policies

7.7.1 Variable Width Roadways ("Scalloped Streets")

Variable width roadways, often referred to as "scalloped streets," occur as a result of roadway segments being constructed at different times. The scalloped streets problem affects the efficiency of the arterial grid network by reducing capacity, causing congestion, and reducing levels of service. It is recommended that a Scalloped Streets Policy be adopted by the local jurisdictions along with a mechanism for funding the roadway improvements.

7.7.2 Arterial Grid Continuity

Regionally, the arterial grid system acts as an overflow for congested freeways, expressways, and other higher level facilities in addition to accommodating local traffic. Closing the gaps in the arterial grid network and mitigating the obstructions to constructing the grid network should continue to be a fundamental regional objective.

7.7.3 Preservation of Right-of-Way

The early protection of rights-of-way for all modes of travel should become a regional policy supported by all cities. It is recommended that rights-of-way for planned, future facilities be protected or preserved, where possible, before development takes place.

7.7.4 Avoid Creation of T-Intersections

The creation of T intersections should be avoided. Currently major T intersections occur at I-10 and SR 85 and at Sun Valley Parkway and I-10.

7.7.5 Safety and ITS

Projects that improve the safety and efficiency of the transportation system should be high regional priorities.

Wilbur Smith Associates
ENGINEERS PLANNERS ECONOMISTS

Table 10
Estimated Costs* of Ultimate Concepts

(all costs in millions of constant 2003 dollars)

Facility	Miles in SWATS Area	New	Widen	Additional Interchanges & Intersection Improvements	Freeway System Interchanges	Major Bridges	ITS	Bikeway	Total
Arterial Roadways									
Arterials	295	$972	$2,376				$63	$211	$3,623
Major River Arterial Bridges						239			239
Subtotal Arterial Roadways		**$972**	**$2,376**	**$0**	**$0**	**$239**	**$63**	**$211**	**$3,862**
Freeways									
I-10: I-17 to Loop 101	9		734		23		**		757
I-10: Loop 101 to Loop 303	9		254	32		***	**		286
I-10: Loop 303 to SR-85	12		346	16			**		362
I-10: SR-85 to Sun Valley Parkway	3		77	16			**		93
I-10: SR-85 to County Line	39			35					35
I-17: I-10 (west) to Camelback†****	3		230						230
I-17: I-10 (west) to 19th Avenue	3		33						33
South Mountain Freeway†	15	755			50	33	15		853
SR-85 north of Gila River	7	50			50	26	7		133
SR-85 south of Gila River	30	40			50		30		120
I-10 Reliever: I-17 to Loop 101 Extension	10	666			200		10		875
I-10 Reliever: Loop 101 to Loop 303	9	644			50	73	9		776
I-10 Reliever: Loop 303 Extension to SR-85	12	553			100		12		665
Loop 101 Widening: I-10 to Camelback†	3	46			35				81
Loop 303 Extension: Northern to I-10†	6	285			45		6		336
Loop 303 Extension: I-10 to I-10 Reliever	5	235			50		5		290
Loop 303 Extension: I-10 Reliever to Riggs Rd	13	602			50	47	13		712
Subtotal Freeways		**$3,875**	**$1,674**	**$99**	**$703**	**$179**	**$107**	**$0**	**$6,638**
Expressways/Parkways									
Loop 101 Extension††	3	21		16			1	1	39
Sun Valley Parkway: I-10 to Camelback†	5		17	13			1	2	32
Rio Salado Parkway†	10	37					**	4	41
Subtotal Expressways/Parkways		**$58**	**$17**	**$29**	**$0**	**$0**	**$2**	**$7**	**$112**
Transit (based on HCTS and RTS)									
LRT: I-10 from downtown Phoenix to Loop 101		400							400
LRT: 51st/59th Ave corridor north of Baseline Rd		730							730
Commuter rail: downtown Phoenix to Buckeye		450							450
Park-and-ride, I-10 @ Litchfield Road		3							3
Park-and-ride, I-10 @ Miller Road		3							3
Park-and-ride, I-10 @ 339th Avenue		3							3
Bus Rolling Stock		700							700
Subtotal Transit		**$2,289**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$2,289**
Multi-Purpose Paved Trails									
Grand Canal: 19th Ave to 75th Ave†	8							3	3
Agua Fria River Bank†	10							3	3
Gila-Salt River: Agua Fria to Rio Salado Expwy	9							3	3
Gila River Bank: Agua Fria to SR-85	17							6	6
Gila River Bank west of SR-85	6							2	2
Roosevelt Canal: Agua Fria to SR-85	20							7	7
Roosevelt Canal: SR-85 to Hassayampa	8							3	3
Waterman Wash	13							5	5
Hassayampa River†	14							5	5
Subtotal Multi-Purpose Paved Trails		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$37**	**$37**
GRAND TOTAL		**$7,194**	**$4,067**	**$128**	**$703**	**$418**	**$172**	**$256**	**$12,937**
Percent of Total		56	31	1	5	3	1	2	100

**These estimates are preliminary and may be superseded in the RTP.*

***Included in "New" or "Widen" cost.*

****Major expansion or replacement of the I-10 bridge over the Agua Fria River will be required to accommodate I-10 widening.*

*****Specific improvements to be determined.*

†Project crosses the SWATS area boundary. Estimated cost includes only the portion within the SWATS area.

††Cost estimate is for a 6-lane parkway facility.

LRT projects would cost approximately half as much if developed as BRT projects on exclusive right-of-way.

LRT, Bus Rolling Stock, and Commuter Rail include costs for portions of projects outside the SWATS area.

Bikeway and ITS costs on major bridges are included in the bridge costs.

Some bridge costs for new roadways are included in new roadway costs and some are shown separately in the bridge column.